Pacific Coast Science and Learning Center

Point Reyes National Seashore
National Park Service
U.S. Department of the Interior

San Francisco Bay Area National Park Research Grants 2006:

Application deadline June 26, 2006

The **Pacific Coast Science and Learning Center** at Point Reyes National Seashore supports effective research and science in Bay Area National Parks and the dissemination of the results. In 2006, we anticipate awarding four grants of up to $1,500 each with an additional $500 available to fund an intern working as a field assistant on your study. We can provide qualified intern candidates. Additional awards are anticipated to be made as funding becomes available.

Examples of 2006 Research priorities:

-Invasive weed control experiments
-Barred owl ecology
-Dietary analysis of wild turkeys
-Vegetation and soil impacts of fallow deer rut
-Raven reponse to various livestock feeding designs
-Social Science Plan for San Francisco Bay Area National Parks

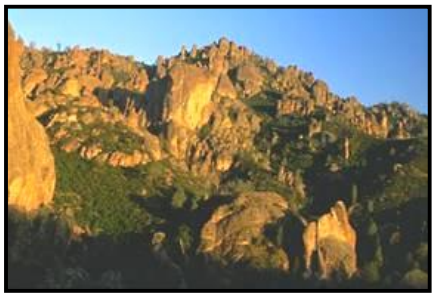
Additional 2006 priorities can be found at the RFP website and on the attached document

Other potential research projects area areas of interest can be found on our **website** under the following disciplines:

Ecosystem Monitoring, Landscape Ecology, Invasive Species, Water Quality/Quantity, Restoration Ecology, Cultural and Environmental History, Wilderness Management, Declining, Rare, Endangered and Sensitive Species, Marine Ecology, Plant Ecology, Wildlife Ecology, Social Science, Fire Ecology, Geology, and Others.

We also encourage researchers to develop projects not identified above.






Clockwise from top left: Point Reyes National Seashore, Golden Gate National Recreation Area, Muir Woods National Monument, and Pinnacles National Monument.

In addition to financial support, the Center also provides **desk space, computer facilities, GIS data, short-term housing, and boat support** to researchers for projects that are particularly relevent to national park service science needs.

Please visit **www.nps.gov/pore/science.htm** to learn more about initiating a project and to download additional copies of this RFP and the application form.

For further information on research priorities or to submit a proposal (**must use four-page application form**) please contact:

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Eamples of Recently Supported Projects:

Calming the controversy: Pigeon Guillemot habitat enhancement and public outreach on Alcatraz Island – UC Davis and PRBO Conservation Science

Peregrine Falcon Population Survey – UC Santa Cruz

West Nile Virus antibody prevalence among raptors – UC Davis

Practical restoration tools to increase native grass establishment – UC Berkeley

Evolutionary significant populations of banana slugs – UC Santa Cruz

Parasites as high-quality indicators of wetland biodiversity – UC Santa Barbara

Algal inventory of Tomales Bay - UC Berkeley, Sonoma State University

Intertidal invertebrate inventory of Tomales Bay - Bodega Marine Lab, Dominican University, LA Co. Museum of Nat. Hist.

Consequences of functional diversity for invastion resistance of fouling communities – UC Davis

Disturbance and mud snails in Tomales Bay – UC Davis

Subtidal Habitat Mapping of Point Reyes National Seashore and Golden Gate NRA - Moss Landing Marine Labs

PCSLC 2006 Grant Application Guidelines

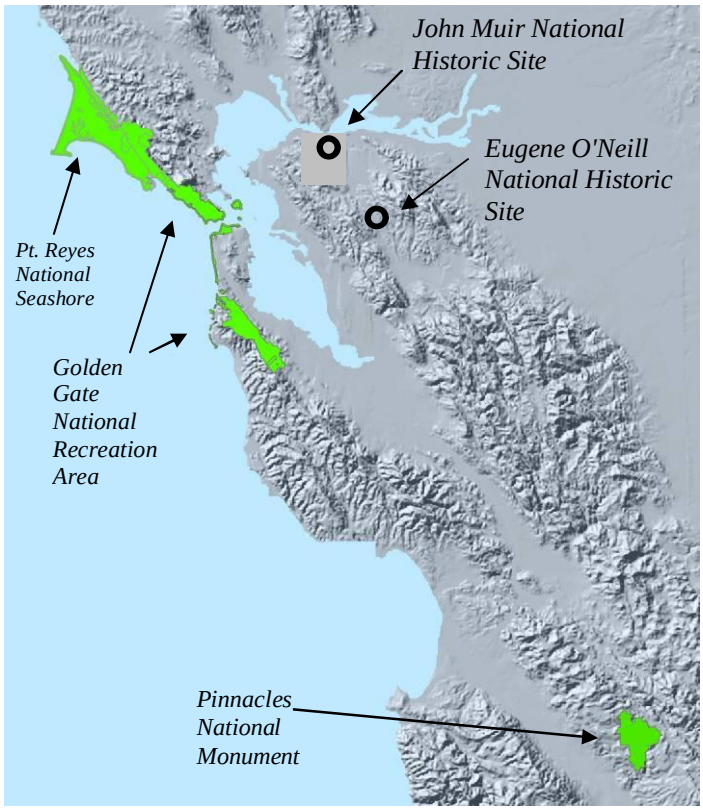
Priority will be given to projects of high research quality that support the Center's mission to understand and maintain the integrity of coastal ecosystems in California's national parks. We encourage scientific research, public education and outreach leading to enhanced understanding and management of coastal and marine resources through innovative partnering. We especially encourage applications from graduate students.

Successful applicants will be encouraged to utilize park facilities available through the Pacific Coast Science and Learning Center. We will also require that awardees give a presentation on their findings to park staff and provide us with a final written summary of their findings (graduate thesis or journal article are also acceptable).

Researchers working on monitoring or inventory projects may also be requested to provide a copy of their data to the host park.

Applicants must use the four-page application form associated with this RFP. Please type answers and print out form or submit via e-mail. **Copies of this RFP and application form are available at:** www.nps.gov/pore/science.htm

Applications must be **received** by Ben Becker by **June 26, 2006.**



San Francisco Bay Area National Parks

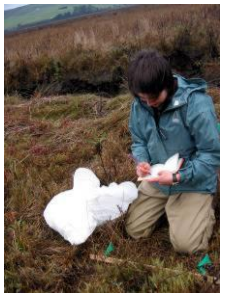
Ranking Criteria (30 points total)

A. Research will inform Park Service management and conservation (10 pts)

B. Sound methods (10 pts)

C. Incorporates educational component (5 pts)

D. Leverages other funds or in-kind costs (5 pts)



*The **San Francisco Bay Area Network of Parks** includes: Golden Gate National Recreation Area (GGNRA), Pinnacles National Monument, Point Reyes National Seashore, Muir Woods National Monument (within GGNRA), Eugene O'Neill National Historic Site, The Presidio (within GGNRA), Fort Point National Historic Site (within GGNRA) and John Muir National Historic Sites.*

2006 Compilation of Research Needs Identified by National Park Service Staff at Pinnacles National Monument and Point Reyes National Seashore.

For more information, contact ben_becker@nps.gov

Research Needs Identified by Pinnacles National Monument Staff (#32-42 developed in 2005)

1. Impact of climbing chalk on the physical structure of the Pinnacle rocks.
2. Impact of climbing bolting to the structural integrity of the Pinnacle rocks.
3. The causes of "pygmy" chamise. (Chamise chaparral that is >40 years old, but only 2-3 feet tall)
4. Distribution of Coast Horned Lizards and the associated ant fauna
5. Impacts of high ozone on indicator plant species as well as general plant flora.
6. Cave temperature/humidity modeling
7. Landuse history of the Chalone Creek Watershed
8. Long-term monitoring of geomorphic change of Chalone Creek
9. Response of creeks to fire frequency and climate change
10. Analysis of central California Climate based upon floodplain sediments, tree rings, and woodrat middens at Pinnacles NM
11. Reconstruct past climates, esp El Nino Phenomenon
12. Assess the Chalone Creek Fault as the Ancestor of the San Andreas Fault
13. Bee faunal associations with fire following plant flora
14. Distribution of Soil Types and Surficial Geology (entire park, not just new lands)
15. Document the recovery of the landscape after the removal of feral pigs both vegetation and soil stability
16. Reintroduction of Foothill Yellow Legged Frogs
17. Reintroduction of Western Spade-foot Toad
18. Assess spatial/temporal distribution of sycamores and willows and the impacts to Western Red Bats
19. Assess the viability of Valley Oaks, are they a remnant Pleistocene species?
20. Distribution and impact of mistletoe
21. Impacts of grazing and fire on bee faunal distributions
23. Impact of fire on bats
24. Distribution of crack/crevice roosting bats and potential impacts of rock climbing.
25. Determine the human carrying capacity of PINN
26. Evaluate visitor use of trail system and impacts to wildlife use of these habitats (trail visitor data available)
27. Determine the source of pollution causing PINN to exceed National standards of ozone (air distribution/movement map)
28. Regeneration of Blue Oaks related to fire and grazing (one year work done)
29. Inventory of Moth species and determination of good indicator species for long-term monitoring efforts.
30. Lichen response to air quality
31. Run-off from parking lots after first rain
32. Understand the impacts of Feral pig fence on movements of Black-tailed deer fawns, other wildlife
33. Experimental studies for restoration of infested rangelands
34. Monitoring of restored floodplain after road removal
35. Develop competitive seed mixes for restoration work

36. Surfactants (used with glyphosate) and their effects on frogs and fish
37. Inventory for accipiters on new lands
38. Monitor spread of invasive plant species by remote sensing
39. Biology of possible new species of sphinx moth
40. Ethnography of land use by Ohlone and Salinan peoples
41. Analysis of how park could better invite, interest and communicate with the west side communities, largely Mexican or of Mexican descent
42. Development of compelling materials for visitors about the topic of invasive plants
43. Fluvial geomorphic survey of the primary creeks, assess the impacts of human development and the health of the creeks.
44. Night Sky Darkness Monitoring (Light Pollution)
45. Impacts of fire on the bee fauna related to vegetation composition change.
46. Floral relations of bee fauna
47. Distribution and breeding success of Cooper's hawks related to trail use
48. Natural succession after natural disasters
49. Phenology – including correlate long-term data sets
50. Expansion of vineyards and other agriculture in county and its effects on water table
51. Necessary wildlife corridors
52. Tarantulas and arachnids
53. Ants
54. Earthworms
55. Analysis of long-term prairie falcon data and assistance with monitoring program design
56. Biological soil crusts
57. Road effects
58. Corvid population and West Nile virus
59. Mountain lions
60. Analysis of long-term air quality data

Also, anything related to climbing and impacts on the natural system would be encouraged, anything on fire effects on wildlife, anything related to bats -- foraging ecology, roosting, etc., anything associating visitor use and changes in wildlife habitat use.

Pinnacles National Monument monitoring questions that rated high:

Pinnacles Vegetation and Fire resources

1. What is mortality, recruitment and general demography of gray pine in and outside the Monument?
2. Is oak recruitment and Mortality within the natural range of variation within the coastal range?
3. How is the gross vegetation community within and adjacent to the park changing? (aerial photos every 5-10 years)
4. Is the distribution and abundance (both actual and relative) of non-native species changing within the Monument? Are there areas where change is happening more quickly? (fence, roads, trails, burned areas, grazed lands, flooded areas, specific habitats)
5. What is the frequency, spatial distribution, intensity and source of fires that occur in the Monument?
6. Are there changes in the native bulb species distribution and abundance as a result of pigs, both inside and outside fence?
7. Is the distribution and abundance of riparian species changing as a result of changes in watertable, flooding etc.?

8. Are there changes in the distribution and abundance of native bunchgrasses, and can areas at Pinnacles be used as reference areas for more disturbed sites?
9. Is the distribution and abundance of plant species from southern California and northern California at the edge of their range changing?
10. Is the distribution and abundance of plant species becoming rare outside of the park changing within the park?

Pinnacles Wildlife resources

1. How does wildlife respond to habitat structure and change in structure through time?
2. Is species "X" increasing or decreasing parkwide and within specific habitats including exotic species?
3. To what extent is Pinnacles National Monument connected to surround open space and how is this changing over time?
4. What kind of habitat does the pinnacles formations provide and for which species over time?
5. How is the aquatic community changing from year to year?
6. Can we use an index of mortality to determine effects of development and use both outside and inside Monument?
7. What is the health of California Thrasher, Sage Sparrow, Wrentit, Blue-grey gnatcatcher, Spotted Towhee related to successful reproduction?
8. What is the health of raptors and ravens related to successful reproduction?

Pinnacles Physical resources

1. How are park roads, tails and parking lots and restoration activities, modifying sediment load, nutrient flow, hydrology, groundwater recharge?
2. What are the changes of land use zoning, and development within 250km of park which effect viewsheds, air, water and light pollution in the park?
3. Are park and surrounding community activities mining groundwater?
4. How are activities altering the park's quality and quantity of water entering the park?
5. What impact is climbing having on the park's number one resource The Rock? How does chalk and bolting affect rock erosion?
6. Do we know where all of the social trails and other areas of soil compaction/erosion activities? Are they getting better or worse?
7. What levels, timing and numbers, spatial distribution, of visitor activities are ocurring in park?
8. How can internal park air pollution sources be reduced to improve the park's impact on regional air quality?
9. How are human sanitation issues, both above and below ground, affecting park resources?
10. What are the fire frequency, intensity, size and seasonality of fires and floods in the park?
11. What is the hydrologic pattern of the park including drying patterns?
12. What is the natural range of variability of sediment flow as related to fire and flood?
13. Where are the hydrophobic soils?

Point Reyes National Seashore Research Needs for Wildlife Ecology (Updated May 2006)

1. Dietary analysis, wild turkeys at PORE - we have 3-4 years of stored crop and gizzard contents from birds collected within the park. There is a need for analysis of the composition of turkey diets in order to predict impacts to native plant and animal species and to build predictive models or impacts and range of turkeys in the future.

2. Still photo and video documentation of understory vegetation and soil impacts of fallow deer rut (October 2006). There is a need to document, on film, the rut activities of fallow deer in Olema Valley, particularly before potentially disruptive management actions, as determined by a publically reviewed EIS, commence.. All information on past rut activities are anecdotal and poorly documented.

3. Comparison of raven numbers and behavior under various livestock feeding designs, i.e., use of covered cattle feeding troughs to decrease supplemental feeding of ravens in PORE pastoral areas (Kehoe and McClure). This project would entail observation of control and covered troughs, measuring raven densities and documenting raven behavior.

4. Barred Owl Ecology and impacts on Northern Spotted Owls

5. Elk exclosures Tomales Point: Repeat protocols established by USGS for monitoring vegetation cover and type inside and outside twelve 30 X 30 m. exclosures at Tomales Point elk reserve. We have data since 1998 (not every year).

Research Needs for Exotic Plant Management (Updated May 2006)
(PORE = Point Reyes National Seashore, GOGA = Golden Gate NRA)

Exotic Plant Control

Conduct herbicide and other treatment trials on oblong spurge. Conduct grassland restoration trials to follow oblong spurge control. (GOGA)

Develop control techniques matrix for *Oxalis pes-caprae.* This recent invader is expanding rapidly into many coastal areas including dune and upland habitats. Effective control methods are needed. (GOGA, PORE)

In riparian areas, can cape ivy be effectively eradicated with heavy machinery immediately prior to slope regrading? Is resprout occurrence any worse than our currently methods of clearing all vegetation to the ground? (GOGA,PORE)

Broom Control: evaluate the use of fire, herbicides, and mechanical removal (weed wrenches, mowers, chainsaws) to reduce or eliminate French/Scotch broom (PORE)

Evaluate the use of fire to control invasive nonnative plants

Exotic Plant Early Detection/Rapid Response

1. Create potential expansion model for two new wind dispersed invaders in coastal habitat, *Helichryusm petiolatum* and *Erigeron karvinskianus*. (GOGA)
2. Develop expansion and colonization models for invasive perennial grasses to identify priority areas to prevent invasion (GOGA)

Exotic Plant Monitoring

1. Identify the seed viability of Helichrysum petiolatum under a variety of conditions (GOGA)
2. Identify factors related to species-specific rates of spread.
3. Do non-native grasses in riparian areas need to be controlled and/or reseeded with native grasses to foster native re-establishment?
4. Develop expansion models for invasive perennial grasses, specifically tall fescue, *Festuca arrundinaceae* and Harding grass, *Phalaris aquatica* and South African veldt grasses (*Ehrharta* sp.). (GOGA, PORE)
5. Evaluate the rate of spread for *Rubus Armeniacus* (formerly known as R. discolor) across bioregions (Coastal California [North and South] and Sierra Nevadas – California EPMT)
6. Evaluate the rate of spread for *Eucalyptus globulus* across bioregions in Northern and Southern California
7. Evaluate the effects of select thinning of Eucalpytus on understory species. (in collaboration with Network Fire Program)
8. Of species identified by the California Invasive Plant Council - what species most effectively exclude native recruitment and establishment? Of those that are most dominant; are there acceptable or tolerable levels and at what threshold should control be implemented? (GOGA)

Exotic Plant Restoration

1. Determination of most detrimental invasive competitors at newly restored sites (GOGA/PORE).
2. Evaluate the effects of invasive plant removal on the restoration of native habitat and natural processes in coastal dune systems (Point Reyes Beach/Limantour Beach)
3. Evaluate the effects of invasive plant removal on the restoration of native habitat and natural processes in coastal bluff systems (Point Reyes Headlands)

Vegetation Management (PORE/GOGA)

1. Fire and rare plant management in chaparral: Can fire or fuels management successfully increase recruitment and survival of rare chaparral species?
    a. Mason's ceanothus
    b. Marin manzanita
2. What is the best monitoring design to use for monitoring select endangered plant species? (Sonoma alopecurus and beach layia) Design should meet USFWS recovery objectives.
3. Develop a long term management strategy for Point Reyes rein orchid
4. Can vegetation maps be refined by using accuracy assessment plots? (PORE-GOGA has 1,600 vegetation plots that were not used in the generation of the final vegetation association/alliance map).

Range Ecology/Grassland Management (PORE/GOGA)

1. Can seasonal/rotational grazing increase coastal prairie native species diversity?
2. Many ranches use nonnative grass seed on their pastures. Can native grass seed be used in pasture improvement to increase native species cover, richness, and biomass?
3. How effective is mowing at controlling nonnative thistles? Research should result in site specific prescriptions for thistle control that can be implemented by local ranchers
4. What species occur in the absence of cattle grazing?

Data Management

1. Evaluate the California Exotic Plant Management Team's system for data collection and tracking to better understand site trends.
2. Establish a GPS interface for tracking data via MSAccess. This process will eliminate duplication of data collection (hard copy in field and re-entering in office).

Research Needs for Social Science (Updated May 2006)

1. Accumulate, articulate, and prioritize a "Social Science Plan for San Francisco Bay Area National Park Service Units" (see "SFlorida.pdf" available at www.nps.gov/pore/science.htm)

2. Develop quantitative and qualitative evaluation tools for educational services of parks in the San Francisco Bay Area Network of national parks (ex: What is the effectiveness of programs offered to high school audiences throughout the area?).

Background information:
There are six categories of Social Science research defined for the National Park Service: economics, geography, psychology, political science, sociology, and interdisciplinary research. All social science research needs will be focused on promoting state-of-the-art methods related to the mission of the National Park Service, and deliver usable knowledge to NPS managers and the public.

Economics (both macro- and micro-economics) treats markets, industries and economies as key units of study; the driving force of change is economic value broadly defined. Economics can aid NPS managers through studies of park economic impacts, the costs and benefits of park policies, and the role of parks in the tourism industry and national economy.

Geography (specifically human geography) treats regions, landscapes and other spatial units (governmental, ecological and so forth) as critical. The central concern is the spatial distribution of people, resources and culture. Geography can aid NPS managers through studies of tourist travel patterns, regional development, land use trends and projections, and human impacts upon park resources, both natural and cultural.

Psychology has the individual as its key unit, and communication is a central driving force. Psychology can assist NPS managers through studies of residents' expectations and visitor experiences, interpretive media and other forms of park communication.

Political science focuses upon institutions of the state (at many levels); the central engine of change to many political scientists is power and its use. Political science can benefit NPS managers through studies of public participation in land use planning, the role of local communities and interest groups, and by improving organizational effectiveness.

Sociology treats social groups, organizations and communities as key units of study, with human behavior its central concern. Sociology can aid NPS managers through studies of demographic trends, cultural values, visitor behavior and public opinion regarding park policies.

Interdisciplinary Research. Disciplines such as environmental economics, conservation biology and human ecology have emerged as important scientific fields relevant to the NPS. Interdisciplinary research, such as studies of visitor impacts upon wildlife or the economic impacts of management policies, requires the social sciences.

Note: the fields of archeology, anthropology, and ethnography are defined within the Cultural Resources program.

Further information on the NPS Social Science Program can be found at: (website address: http://www.nature.nps.gov/socialscience/